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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/006,404	11/30/2001	Young Wan Kim	51876p280	4286

8791 7590 12/27/2004

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EXAMINER

SAMS, MATTHEW C

ART UNIT PAPER NUMBER

2643

DATE MAILED: 12/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/006,404

Applicant(s)

KIM ET AL.

Examiner

Matthew C. Sams

Art Unit

2643

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/30/2001.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement submitted November 30, 2001 has been considered.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joshi (US-5,416,449).

Regarding claim 1, Joshi teaches an apparatus for canceling a leakage signal using harmonic mixer. (Col. 2 lines 32-43) Joshi teaches an in-phase dividing means for dividing a first signal inputted into first in-phase signals. (Col. 3 lines 24-32 and Fig. 1 [40]) Joshi shows two out-of phase signals inputted from an exterior means with a phase

difference of 90° . (Fig. 1 [28] & [38] and Col. 2 line 56 through Col. 3 line 10) Joshi teaches an even harmonic mixing means for outputting 90° out of phase radio frequency signals after even harmonic mixing of the in-phase signals is outputted from dividing and the second out of phase signals is outputted from the phase dividing. (Col. 2 line 56 through Col. 3 line 10) Joshi teaches RF signal phase combining means for the out-of-phase radio frequency signals outputted from the even harmonic mixer. (Col. 2 line 56 through Col. 3 line 10) Joshi teaches a band pass filter for canceling a leakage signal in the radio frequency signals outputted from the signal phase combiner. (Col. 3 lines 24-32) Joshi differs from the claimed invention in not showing a divider for the second signal inputted with a phase difference of 90° . However, Joshi teaches two "Modulation ports that are configured to receive user-supplied modulation signals having the same modulation frequency but with a phase difference of 90° ". (Col. 6 lines 26-29) Therefore, it is obvious that one of ordinary skill in the art would be motivated to use a phase dividing means to attain the phase difference of 90° since Joshi's modulation ports are configured to receive signals with the same modulation frequency and a phase difference of 90° . (Col. 6 lines 22-36)

Regarding claim 2, Joshi teaches first even harmonic mixer for outputting a first radio frequency signals by mixing a quadrature phase second signal outputted from the phase divider, using the in-phase signals outputted from the in-phase divider. Joshi teaches a second even harmonic mixer for outputting an in-phase second signal outputted from the phase dividing means with the radio frequency signal. (Col. 2 line 56 through Col. 3 line 10, Col. 6 lines 37-48 and Fig. 1)

Regarding claim 3, Joshi teaches a multiplexer for mixing the second out-of-phase signals outputted from the phase divider and the first in-phase signal outputted from the in-phase divider. Joshi teaches an anti parallel diode pair for suppressing a basic frequency and a radio frequency component while mixing odd numbers of radio frequencies of the LO signal and suppressing an even number of radio frequencies of the LO signal. (Col. 2 line 56 through Col. 3 line 10, Col. 6 lines 37-48 and Fig. 1)

Regarding claim 4, Joshi teaches of using Schottky diodes. (Col. 9 lines 46-61)

Regarding claim 5, the limitations of claim 5 are rejected as the same reason set forth in claim 1.

Regarding claim 6, the limitations of claim 6 are rejected as the same reason set for in claim 2.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US-5,918,167 to Tiller et al. about quadrature downconverter local oscillator leakage canceller.

US-6,658,237 to Rozenblit et al. about a transceiver utilizing a direct conversion receiver.

US-6,671,500 to Damgaard et al. about a transceiver and a frequency plan.

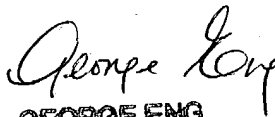
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Sams whose telephone number is (703)305-0810. The examiner can normally be reached on M-F 7:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz can be reached on (703)305-4708. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MCS
12/15/2004


GEORGE ENG
PRIMARY EXAMINER